

## Claims

1. Method for refining paper fibers or cellulose fibers in aqueous suspension in which the fiber stock is guided through at least one refining zone lying between refining surfaces (1, 2), in which the refining surfaces (1, 2) lie on refiner tools pressed against one another, whereby mechanical refining action is transferred to the fibers such that the strengths of the paper produced therefrom are changed, whereby the refining surfaces (1, 2) are moved relative to one another such that, at the point at which two refining surfaces (1, 2) are closest in the refining zone, the relative speed between the fiber stock and the refining surfaces, seen in the main direction of movement of the refining surfaces, is no more than 10% of the absolute speed of the refining surface moved quickest, characterized in that at least one of the refining surfaces (1, 2) interacting in the refining zone is porous.
2. Method according to claim 1, characterized in that both of the refining surfaces (1, 2) interacting in the refining zone are porous.
3. Method according to claim 1 or 2, characterized in that the porous refining surface (1, 2) is formed by a material layer (7, 7', 8, 8') open-pored at least to the refining surface (1, 2).
4. Method according to claim 3, characterized in that the material layer (7, 7', 8, 8') is composed of sintered material.
5. Method according to claim 4, characterized in that the material layer (7, 7', 8, 8') is composed mainly of chromium steel.
6. Method according to claim 4, characterized in that the material layer (7, 7', 8, 8') is composed mainly of hard metal.
7. Method according to claim 4, characterized in that the material layer (7, 7', 8, 8') is composed mainly of a copper alloy.

8. Method according to claim 4, characterized in that the material layer (7, 7', 8, 8') is composed mainly of ceramic.
9. Method according to claim 4, characterized in that the material layer (7, 7', 8, 8') is composed mainly of plastic.
10. Method according to one of claims 3 through 9, characterized in that the layer thickness of the material layer (7, 7', 8, 8') is at least 1 mm and no more than 30 mm, preferably 10 – 20 mm.
11. Method according to one of the preceding claims, characterized in that the average pore width of the porous refining surface (1, 2) is smaller than 0.5 mm.
12. Method according to one of the preceding claims, characterized in that, at the point at which two refining surfaces (1, 2) are closest to one another in the refining zone, the relative speed between the fiber stock and the refining surfaces seen in the main direction of movement of the refining surfaces (1, 2), is less than 5% of the absolute speed of the refining surface (1, 2) moved quickest.
13. Method according to one of claims 1 through 11, characterized in that the relative movement of the refining surfaces (1, 2) in the refining zone is a rolling movement.
14. Method according to one of the preceding claims, characterized in that the mechanical refining action is transferred by compressing the fiber stock.
15. Method according to one of the preceding claims, characterized in that at least one refining surface (1, 2) is provided with refiner bars (5, 5', 6, 6') running crosswise to the main direction of movement of the moved refining surface.

16. Method according to claim 15, characterized in that the refiner bars (5, 5', 6, 6') have a height of at least 2 mm and a width in the direction of movement of the moved refining surfaces of at least 2 mm.
17. Method according to claim 15 or 16, characterized in that both refining surfaces (1, 2) are provided with refiner bars (5, 5', 6, 6') running crosswise.
18. Method according to one of the preceding claims, characterized in that the absolute speed of at least one refining surface (1, 2) is kept at a value between 5 and 30 m/sec.
19. Method according to one of the preceding claims, characterized in that the refining surfaces (1, 2) are pressed against one another such that a linear force between 2 and 10 N/mm is generated in the refining zone.
20. Method according to one of the preceding claims, characterized in that at least one of the refiner tools has gaps, in particular tooth gaps (20) on the refining surface (1, 2), which gaps are moved in the refining zone such that they transport the suspension (S) through the refining zone in the direction of movement of the refiner tools.
21. Method according to claim 20, characterized in that the gaps are emptied of the fibers outside the refining zone.
22. Method according to claim 21, characterized in that the emptying of the gaps is carried out by centrifugal forces.
23. Method according to claim 20, 21 or 22, characterized in that one of the refiner tools is a refiner cylinder (3, 3', 3'') and that the other refiner tools are refiner rolls (4, 4') arranged parallel thereto and set in a rolling motion on the circumferential surface of the refiner cylinder (3, 3').

24. Method according to claim 23, characterized in that the refiner cylinder (3, 3', 3'') is driven and that the refiner rolls (4, 4') rotate about spatially fixed axes.
25. Method according to claim 23 or 24, characterized in that the refiner cylinder (3', 3'') is provided with cylindrical porous surface and that the gaps are located on the circumference of the refiner roll.
26. Method according to one of claims 23 to 25, characterized in that refiner cylinders (3, 3', 3'') and refiner rolls (4, 4') lie essentially horizontally and that the direction of the suspension transport through the refining device used is essentially the circumferential movement of the refiner cylinder.
27. Method according to one of the preceding claims, characterized in that the compressive forces for refining the paper or cellulose fibers are transferred to surfaces on which the refiner tools roll against one another.
28. Method according to one of claims 23 through 27, characterized in that the diameter of the refiner cylinder (3, 3', 3'') is at least 1 ½ times, preferably at least twice the diameter of the refiner roll (4, 4').
29. Method according to claim 28, characterized in that the refiner rolls are arranged close together on the circumference of the refiner cylinder (3, 3', 3'') so that as many refining zones as possible are formed on one refiner cylinder.
30. Method according to one of the preceding claims, characterized in that the refining is carried out on a suspension guided constantly through the refining device used.
31. Method according to one of the preceding claims, characterized in that the aqueous suspension is fed into the refining device used with a consistency of 1 – 6 %.

32. Method according to one of claims 1 through 30, characterized in that the aqueous suspension is fed into the refining device used with a consistency of 6 – 15 %.
33. Method according to one of claims 1 through 30, characterized in that the aqueous suspension is fed into the refining device used with a consistency of 15 - 25 %.
34. Method according to one of the preceding claims, characterized in that the force with which the refiner tools respectively forming a refining zone are pressed together is adjustable, in particular can be adjusted differently for various refining zones.